REMARKS

In accordance with the foregoing, claims 10 and 20 have been amended. Claims 1-5, 7, 8, 10-14, and 16-20 are pending and under consideration. No new matter is presented in this Amendment.

ENTRY OF AMENDMENT UNDER 37 C.F.R. §1.116:

Applicants request entry of this Rule 116 Response because it is believed that the amendment of claims 10 and 20 and the Declaration should not entail any further search by the Examiner since no new features are being added or no new issues are being raised.

The Manual of Patent Examining Procedures sets forth in Section 714.12 that "any amendment that would place the case either in condition for allowance or in better form for appeal may be entered." Moreover, Section 714.13 sets forth that "the Proposed Amendment should be given sufficient consideration to determine whether the claims are in condition for allowance and/or whether the issues on appeal are simplified." The Manual of Patent Examining Procedures further articulates that the reason for any non-entry should be explained expressly in the Advisory Action.

REJECTIONS UNDER OBVIOUSNESS TYPE DOUBLE PATENTING:

On pages 2-3 of the Office Action, the Examiner provisionally rejects claims 1-8, 10-14 and 16-20 under the judicially created doctrine of obviousness-type double patenting in view of selected claims of copending Application No. 10/806,107. While it is believed that the rejection is premature since U.S. Patent Application No. 10/806,107 has not yet been issued as a patent, and since claims 1-8, 10-14 and 16-20 of the instant application have not yet been indicated as allowable, in view of the enclosed Terminal Disclaimer, it is respectfully requested that the Examiner reconsider and withdraw the rejection.

REJECTIONS UNDER 35 U.S.C. §102:

On pages 3-4 of the Office Action, the Examiner rejects claims 10, 12 and 19 under 35 U.S.C. §102(e) in view of Ichihara (U.S. Patent No. 6,396,792). The rejection is respectfully traversed and reconsideration is respectfully requested.

By way of review and as previously noted in the Amendment filed October 13, 2006, Ichihara discloses a waveform of recording pulses having erasure steps Pc1 and Pc2 when an NRZI signal as shown in FIG. 1A is low. Ichihara also discloses recording pulses including recording steps Pc1, Pa when the NRZI signal as shown in FIG. 1A is high. While not labeled in FIG. 1B, a first one of the recording pulses has a level which is below the power level Pc1 (and

appears to be Pc), and increases into a second pulse having a level of Pa. As such, the power level of the pulse between the recording and erase pattern is shown as less than the first pulse of the erase signal having the power level Pc1 and is not shown as being the high power level Pc1 used in the erase steps.

On page 4 of the Office Action, the Examiner asserts that col. 6, line 62 to col. 7, line 1 teaches that the power level of a period corresponding to the recited period of claim 10 may be changed from Pc1 to Pa. As a point of clarification, col. 6, line 64 to col. 7, line 1 suggests that adjustments are made to the timing and the bias power levels (Pc1, or Pc2) between the first pulse (i.e., the first pulse Pa) and an off pulse (i.e., the pulse level Pc2) of the amorphous mark, but not to the period before the first pulse of the amorphous mark. As such, the power levels discussed in this passage are related to the recording waveform adjusting between off power levels between Pc1 and Pc2 after the first pulse Pa. Thus, while confusing, this passage refers to pulse timings and off pulse power levels for the amorphous mark and not to pulses outside of the recording pulses used to create the amorphous mark.

At most, any reference to a power level between the amorphous and crystal marks relates to the statement in col. 7, line 1 that these adjustments occur after once returning "it to the conventionally used Pc level," which is shown in FIG. 1B. The passage does not describe the power for the pulse prior to the first pulse Pa as being other than the power level Pc.

This understanding is further confirmed by the FIGs. 3 and 4 as explained in cols. 8 - 9. These drawings and disclosures show that the multiple pulses more accurately form erasures and marks. When initiating an erasure, Ichihara suggests alternating between high and low pulses Pc1, Pc2 in order to promote crystallization growth and nuclei formation. The pulse power levels are due to the different temperatures at which crystals grow and nuclei are generated as shown in FIG. 3. By ending with the low pulse Pc2 during the final period Tc4 as shown in FIG. 4, nuclei are no longer formed and grown consistent with the desired temperature profile C shown in FIG. 4. Thus, ending with the lower temperature at the end of the pattern ensures that the erasure pattern ends prior to the next mark.

In view of this suggestion, should the passage in col. 6, line 64 to col. 7, line 1 describe ending at the high level Pc1 instead of the shown level Pc, the profile C could not be achieved since the final temperature would seemingly remain in a crystal nuclei/growth range between the melting temperature Tm and the crystallization temperature Tx. Therefore, the passage relied upon by the Examiner refers to adjustments to the bias pulse of the amorphous mark, and does not refer to adjusting the power of the pulse Pc.

Moreover, while the Examiner was unavailable for an interview when co-inventor Kyung-geun LEE was in Washington DC and available to clarify these issues, Mr. Lee reviewed and confirmed our understanding of Ichihara (U.S. Patent No. 6,396,792) to the extent that the passage in col. 6, line 64 to col. 7, line 1 relates to the first pulse and the last off pulse of the amorphous mark, where adjustments are made to the timing of the amorphous mark, and adjustments are made to the power levels of the first pulse and the power level of the last off pulse. A more detailed explanation of the factual underpinnings for Mr. Lee's conclusions is included in the enclosed Declaration under Rule 132.

In contrast, claim 19 recites, among other features, that "a power level of the leading pulse of the second pulses is at the high power level of the multi-pulse and a power level of a period between an end point of the second pulses and a start point of the first pulses is at the high power level of the multi-pulse" as recited in claim 19. As such, it is respectfully submitted that Ichihara does not disclose or suggest the invention as recited in claim 19.

For at least similar reasons, it is respectfully submitted that Ichihara does not disclose or suggest the invention as recited in claim 12.

Lastly, consistent with the Examiner's statement on page 10 of the Office Action, it is respectfully submitted that Ichihara does not disclose or suggest, among other features, that "a power of the leading pulse of the second pulses is equal to a power of a period between an end point of the second pulses and a start point of the first pulses" and "a cooling pulse concatenating and included in the recording and erase patterns and having a cooling power level less than the power level of the leading pulse of the second pulses" as recited in claim 10.

REJECTIONS UNDER 35 U.S.C. §103:

On pages 5-7 of the Office Action, the Examiner rejects claims 1, 3-5 and 7 under 35 U.S.C. §103(a) in view of Ohno et al. (U.S. Patent No. 5,150,351) and Ichihara. The rejection is respectfully traversed and reconsideration is respectfully requested.

By way of review, Ohno et al. suggests a pulse spacing period having narrow signals which alternate between a playback power level Pr and an erase power level Pb according to 1 and 0 states of a signal as shown in FIG. 4(a). (Col. 6, lines 4-51; Figs. 4A through 5(d)). Even assuming arguendo the beginning pulse and ending pulses within the 0 state are at a Pr level when the signal of FIG. 4(a) increases from 0 to 1, the pulse increases from the Pr level while at 0 to a Pp level at 1. There is further no suggestion that another power level exists between the 0 and 1 states of the signal in FIG. 4(a), or that the power level of such a pulse should be or is at

the Pr level as opposed to the Pp level.

In order to cure this deficiency, the Examiner relies upon col. 6, line 62 to col. 7, line 1 of Ichihara to teach that the power level of a period corresponding to the recited period of claim 10 may be changed from Pc1 to Pa. However, as noted above in relation to the rejection of claim 19 in view of Ichihara, the relied upon passage in Ichihara is drawn to the power levels between the first recording pulse Pa and the last off pulse of the recording waveform, which is shown as Pc2. Specifically, while the passage relates to the growth of crystals, Ichihara teaches that crystalline growth is desired for the space preceding the amorphous mark. There is no suggestion in Ichihara that the same adjustment should be applied to other pulses between the recording and erase waveforms since the problem being solved in Ichihara relates to failure to erase problems shown in FIG. 1E. (Col. 8, lines 7-20 of Ichihara).

Moreover, Ichihara teaches away from using a low power lead pulse, such as that described in Ohno et al. Specifically, as is evident from FIGs. 3 and 4 as explained in cols. 8 - 9, the use of the multiple pulses is performed in order to more accurately form erasures and marks. When initiating an erasure, Ichihara suggests alternating between high and low pulses Pc1, Pc2 in order to promote crystallization growth and nuclei formation. The pulse power levels are due to the different temperatures at which crystals grow and nuclei are generated as shown in FIG. 3. By starting off with a high pulse Pc1 during the initial period Tc1 as shown in FIG. 4, nuclei are formed and then grown. Moreover, this pattern is consistent with the desired temperature profile C shown in FIG. 4, which requires the higher temperature at the beginning of the pattern in order to start the erasure pattern and a lower temperature at the end of the pattern in order to ensure that the erasure pattern ends prior to the next mark. As set forth in col. 9, lines 25-31, this pattern as shown in FIG. 1B is used in order "to ensure the effects of the present invention," which is also the purpose set forth in col. 1, lines 1-7 in relation to generating the growth of crystal nuclei of the space.

Ichihara does not suggest that the last pulse be at a high power level Pc1, which would appear to extend the erasure pattern into the adjacent mark, and does not suggest that the first pulse be at a low level Pc2, which would delay erasure. Specifically, Ichihara does not suggest another pattern (regardless of power level) in which the first erasure pulse is anything other than a high power level since the high power level ensures that the temperature level in period Tc1 is within the high crystalline nuclei growth frequency needed to ensure that the fail to erase problems are resolved. Thus, any such combination would appear to teach against using the low level lead pulse shown in Ohno et al., and would further teach the use of a power level that

is less than the high power level Pc1 in order to achieve the goal set forth in col. 1, lines 1-7. In view of the evidence of record, one skilled in the art would have, in view of Ichihara, been motivated to adjust the first pulse to be the high pulse as opposed to the shown low pulse such that the combination does not suggest using the low level lead pulse for the erase pattern, and/or to not adjust a level of a period between the erase and recording patterns to be a high power pulse of the erase pattern.

Therefore, it is respectfully submitted that there is insufficient evidence of a motivation to make the combination in a manner which suggests the features of claim 1 as is required to maintain a prima facie obviousness rejection under 35 U.S.C. §103.

For at least similar reasons, it is respectfully submitted that the combination does not disclose or suggest the features of claims 5 and 7.

It is respectfully submitted that the combination does not disclose or suggest the invention as recited in claims 3 and 4 due at least to their depending from claim 1.

On page 7 of the Office Action, the Examiner rejects claim 8 under 35 U.S.C. §103(a) in view of Ohno et al., Ichihara, and Clark et al. (U.S. Patent 5,802,031). The rejection is respectfully traversed and reconsideration is requested.

Even assuming arguendo that the Examiner's characterization of Clark et al. is correct, the Examiner does not rely upon Clark et al. as curing the above-noted deficiency of the combination of Ohno et al. and Ichihara as applied to claim of claim 1, from which claim 8 depends. As such, it is respectfully submitted that the combination does not suggest the features of claim 8.

On pages 7-9 of the Office Action, the Examiner rejects claims 10, 11, 13, 14 and 20 under 35 U.S.C. §103(a) in view of Ohno et al. and Furumiya et al. (U.S. Patent 5,490,126). The rejection is respectfully traversed and reconsideration is requested.

As similarly noted above in relation to the rejection of claim 1, Ohno et al. does not suggestion that another power level exists between the 0 and 1 states of the signal in FIG. 4(a), or that the power level of such a pulse should be or is below the Pr level. Similarly, to the extent Furumiya teaches edge shifting, Furumiya in FIG. 1(b) teaches that a constant erase power should be maintained prior to the first write pulse. Furumiya is not relied upon as teaching the use of a power level below the Pr level. As such, consistent with the Examiner's statement on page 10 of the Office Action, it is respectfully submitted that the combination does not disclose or suggest, among other features, that "a power of the leading pulse of the second pulses is

equal to a power of a period between an end point of the second pulses and a start point of the first pulses" and "a cooling pulse concatenating and included in the recording and erase patterns and having a cooling power level less than the power level of the leading pulse of the second pulses" as recited in claim 10.

For at least similar reasons, it is respectfully submitted that the combination does not disclose or suggest the features of claim 20.

Claims 11, 13, and 14 are deemed patentable due at least to their depending from claim 10.

ALLOWABLE SUBJECT MATTER:

On page 10 of the Office Action, the Examiner objects to claims 2 and 16-18 as being dependent upon a rejected base claim.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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